

Amendment to Claims

Please withdraw without prejudice claims 9-13.

1. (Original) A method of fabricating a compositionally modulated electrode in a magnetic tunnel junction device, comprising:
 - depositing a mask layer on a surface of a previously fabricated electrode of the magnetic tunnel junction device, the electrode including a first resistivity;
 - patterning a plasma mask in the mask layer;
 - forming the plasma mask in the mask layer so that a portion of the surface is exposed by the plasma mask;
 - forming a high resistivity region that extends inward of the surface by exposing the portion of the surface to a plasma process selected from the group consisting of a plasma oxidation process, a plasma nitridation process, and a plasma carburization process, the high resistivity region including a second resistivity that is higher than the first resistivity; and
 - removing the plasma mask from the surface of the electrode.
2. (Original) The method as set forth in Claim 1 and further comprising:
 - continuing the forming of the high resistivity region until the high resistivity region extends inward of the surface by a predetermined depth.
3. (Original) The method as set forth in Claim 1, wherein the plasma oxidation process comprises a gas plasma including a carrier gas comprising oxygen.
4. (Original) The method as set forth in Claim 1, wherein the plasma nitridation process comprises a gas plasma including a carrier gas comprising nitrogen.
5. (Original) The method as set forth in Claim 1, wherein the plasma carburization process comprises a gas plasma including a carrier gas comprising carbon.
6. (Original) The method as set forth in Claim 1, wherein the forming the plasma mask comprises a process selected from the group consisting of etching the mask layer and developing the mask layer.

7. (Original) The method as set forth in Claim 1, wherein the mask layer comprises a photoresist material.

8. (Original) The method as set forth in Claim 1 and further comprising:

continuing the forming of the high resistivity region until the second resistivity of the high resistivity region reaches a predetermined value of resistivity.

9. (Withdrawn) A method of fabricating a compositionally modulated electrode in a magnetic tunnel junction device, comprising:

depositing an alloy layer on a surface of a previously fabricated electrode of the magnetic tunnel junction device, the electrode including a first resistivity;

depositing a mask layer on the alloy layer;

patterning the mask layer to form an etch mask on the alloy layer;

etching the alloy layer to form an alloy patch on the surface;

removing the etch mask from the alloy patch; and

alloying the alloy patch with the electrode by applying heat to form a high resistivity region that extends inward of the surface, the high resistivity region including a second resistivity that is higher than the first resistivity.

10. (Withdrawn) The method as set forth in Claim 9 and further comprising:

continuing the alloying of alloy patch with the electrode until the high resistivity region extends inward of the surface by a predetermined depth.

11. (Withdrawn) The method as set forth in Claim 9, wherein the alloy layer comprises an electrically conductive material.

12. (Withdrawn) The method as set forth in Claim 11, wherein the electrically conductive material is a material selected from the group consisting of a metal, a metal alloy, a semiconductor material, a doped glass, a doped tetraethylorthosilicate, polysilicon, aluminum, tungsten, and copper.

13. (Withdrawn) The method as set forth in Claim 9 and further comprising:

continuing the alloying of alloy patch with the electrode until the second resistivity of the high resistivity region reaches a predetermined value of resistivity.

Claims 14-21 (Previously Withdrawn).